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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/803,613

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G. Dickey Arndt

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EXAMINER

TERESINSKI, JOHN

ART UNIT

PAPER NUMBER

2858

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/803,613		ARNDT ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	John Teresinski		2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-80 is/are pending in the application.
- 4a) Of the above claim(s) 46-52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-45 and 53-80 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3/5/01</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-45 and 53-81, drawn to superstrates detection device method, classified in class 324, subclass 639.
- II. Claims 46-52, drawn to a computer simulation device, classified in class 703, subclass 6.

Inventions II and I are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as performing simulation of transmission line operating characteristics. See MPEP § 806.05(d).

During a telephone conversation with Theodore Ro on December 8, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-45 and 53-81. Affirmation of this election must be made by applicant in replying to this Office action. Claims 46-52 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 7,9-13, 15-17, 24, 37, 40-45, 53, 62, 64 and 65 are rejected under 35

U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,695,155 to Macdonald et al..

Regarding claim 37, Macdonald et al. disclose a single elongate conductive strip (25), a conductive ground plane (26) and a substrate (30) mounted on an opposite side of a superstrates (column 3 lines 21-36, Fig. 2), the substrate separating said single elongate conductive strip and the conductive ground plane (Fig. 2).

Regarding claim 53, Macdonald et al. disclose providing a plurality of measurement cells within a transmission line (Fig. 2 elements 25 and 28A and 28B), applying a signal to said transmission line such that said signal is applied to each of said measurement cells (column 3 lines 50-55) and measuring an output signal from the transmission line for detection of a superstrates (column 4 lines 10-38).

Regarding claim 1, Macdonald et al. disclose a transmission line (25) a substrate mounted on an opposite side of said transmission line from said one or more superstrates (Fig. 2), a plurality of measurement cells formed within said transmission line (28A and 28B), a microwave source for applying a microwave signal to the transmission line and each of the plurality of measurement cells formed within said transmission line (column 3 lines 50-55 and 65-67) and a detector for detecting said one or more superstrates with respect to the plurality of measurement cells (46).

Regarding claims 7 and 40, Macdonald et al. disclose the substrate has a dielectric constant less than five/low dielectric constant (column 3 lines 43-56).

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Regarding claims 9, 12, 13, 42, 43 and 44, Macdonald et al. disclose each of said plurality of measurement cells being spaced apart along said transmission line with respect to each other (Fig. 5).

Regarding claims 10, 11 and 45, Macdonald et al. disclose a known superstrate for covering a plurality of non-measurement portions of said transmission line not including said measurement cells (32).

Regarding claims 15, 16 and 41, Macdonald et al. disclose at least one of said one or more superstrates is formed of a porous material (68).

Regarding claim 17, Macdonald et al. disclose transmission line is uniform along its length without discontinuities (Fig. 5).

Regarding claim 24, Macdonald et al. disclose transmission line is configured to provide a signal to said detector that is substantially unaffected by a thickness of said one or more superstrates (column 4 lines 28-38).

Regarding claim 62, Macdonald et al. disclose applying a plurality of frequencies (column 3 lines 38-40).

Regarding claim 64, Macdonald et al. disclose a data acquisition board (46).

Regarding claim 65, Macdonald et al. disclose the signal is a microwave signal (column 3 lines 50-55 and 65-67).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 25 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,407,555 to Joshi et al..

Regarding claim 25, Joshi et al. disclose a center conductor, two outer conductors mounted such that the center conductor is disposed between the two outer conductors such that a respective spacing is formed on either side of the center conductor separating the center conductor from said two outer conductors, the center conductor and said two outer conductors being oriented parallel with respect to each other (Fig. 13), and a substrate mounted on an opposite side of the waveguide sensor from the superstrate/material under test (column 10 lines 54-55, Fig. 13).

Regarding claim 35, Joshi et al. disclose the respective spacing is equal to each other (Fig. 13).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 8, 23, 36, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macdonald et al. in view of Joshi et al..

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Regarding claims 2, 23, 36, 38 and 39, Macdonald et al. does not disclose a coplanar waveguide with a center conductor mounted between two outer conductors. Joshi et al. disclose a coplanar waveguide with a center conductor mounted between two outer conductors (Fig. 13). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a coplanar waveguide with a center conductor mounted between two outer conductors as taught by Joshi et al. into Macdonald et al. for the purpose of providing a sensor with increased sensitivity.

Regarding claim 8, Macdonald et al. does not disclose a coaxial cable connected to the transmission line with a gold ribbon connection. Joshi et al. disclose a coaxial cable connected to the transmission line with a gold ribbon connection (column 9 lines 25-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a coaxial cable connected to the transmission line with a gold ribbon connection as taught by Joshi et al. into Macdonald et al. for the purpose of providing a connection with more suitable loss characteristics.

Claims 14, 18-22, 56-61 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macdonald et al. in view of U.S. Patent No. 5,474,261 to Stolarczyk et al..

Regarding claims 14, 18-22, 56-61 and 63, Macdonald et al. does not disclose a plurality of transmission lines, a plurality of measurement cells formed on each of the plurality of transmission lines, and a multiplexor for switching between the plurality of transmission lines. Stolarczyk et al. disclose an ice detection apparatus including a plurality of transmission lines, a plurality of measurement cells (12) formed on each of the plurality of transmission lines, and a

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multitplexor (13) for switching between the plurality of transmission lines (Fig. 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a plurality of measurement cells and a multitplexor as taught by Stolarczyk et al. into Macdonald et al. for the purpose of diagnosing several different regions of a region under test.

Claims 54, 55 and 66-75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macdonald et al. in view of U.S. Patent No. 5,233,306 to Misra.

Regarding claims 54, 55, 66 and 75, Macdonald et al. disclose applying a plurality of frequencies to the waveguide (column 3 lines 38-40). Macdonald et al. does not disclose measuring an amplitude and phase for each of the plurality of frequencies to produce an observed data vector and estimating a complex constant for said one or more measurement positions to produce an estimated data vector. Misra discloses a method and apparatus for measuring an amplitude and phase for each of the plurality of frequencies to produce an observed data vector and estimating a complex constant for said one or more measurement positions to produce an estimated data vector in the microwave frequency range (column 5 lines 4-16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include to include an estimatated data vector as taught by Misra into Macdonald et al. for the purpose of providing real time measurements of complex permitivity (column 1 lines 36-59).

Regarding claim 67, Macdonald et al. disclose providing that characteristic impedance and propagation constants of the waveguide are known when the waveguide is covered by a superstrate (32) (column 4 lines 38-37).



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Regarding claims 68, 69, and 71-74, Macdonald et al. does not disclose calibration of the observed data vector. Misra discloses comparing the observed data vector with the estimated data vector to produce a difference data vector and reiterating steps of estimating and comparing until said difference data vector approaches zero, and determining a final estimated complex constant for each of the superstrates due to temperature changes (column 7 lines 1-23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the calibration steps as taught by Misra into Macdonald et al. for the purpose of to correct for instrument drift.

Regarding claim 70, Macdonald et al. does not disclose constraining values of the estimated complex constant for each of the one or more measurement positions to discrete values. Misra discloses constraining values of the estimated complex constant for each of the one or more measurement positions to discrete values (column 5 lines 57-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include the values as taught by Misra into Macdonald et al. for the purpose of providing an output directly to a processor (column 5 lines 57-62).

Claims 3-6, 26-34 and 76-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macdonald et al. and Joshi et al. as applied to claims 2 and 25 above, and further in view of U.S. Patent No. 5,629,485 to rose et al..

Regarding claims 3-6, 26, 29 and 76-80, Macdonald et al. disclose an elongate transmission line greater than ten feet (Fig. 5). Macdonald et al. as modified does not disclose

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spacings on the order of 1/100 of an inch. Rose et al. disclose a coplanar waveguide including spacings on the order of 1/100 inch (column 4 lines 6-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to include a spacing of 1/100 inch as taught by Rose et al. into Macdonald et al. as modified since a modification would have involved a mere change in the size of a component.

Regarding claim 27, Macdonald et al. disclose detecting a superstrate less than two millimeters thick (column 4 lines 10-14).

Regarding claim 28, see claim 7 above.

Regarding claim 30, see claim 16 above.

Regarding claims 31-33 see claims 9, 12 and 13 above.

Regarding claim 34, see claims 10 and 11 above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Teresinski whose telephone number is (571) 272-2235. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (571) 272-2233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JT

JT

December 27, 2004



**ANJAN DEB  
PRIMARY EXAMINER**